

REMARKS

The application currently contains claims 1-6, 8-12 and 16-36. Claims 7 and 13-15 have been cancelled with prejudice.

DRAWINGS

Examiner states that some of the features in the claims are not shown in the drawings. However, aircraft vehicle is provided in figure 1, and the uninhabited aerial vehicle, civilian aircraft and multi-role rotary-wing aircraft are all examples of such aircraft vehicle. There is no requirement to show in the drawings any type of example of features disclosed in the claims.

The term "projectiles" is not new and is not a feature of the invention. Claim 29 discloses a use of the externally mounted Stores Transfer Kit. The projectiles are not part of the system or part of the subject matter. The term "electronic countermeasures" should be handled similarly. As a result, claims 28 and 29 should not be objected under 37 CFR 1.83(a).

Claims 7 and 13-16 that disclose the terms "external fuel container" and "T-valve" have been cancelled with prejudice to conform to the original drawings.

CLAIM OBJECTION

According to the examiner's request on clause 3 of the office communication dated December 2, 2008, Applicant amended the typing mistake of claim 7.

CLAIM REJECTIONS – 35 USC 112

The application contains claims 1-31. Claims 28-30 have been cancelled. Claim 1 has been amended.

As to claim 1, the single functionality external fuel tank carrier pylon is another pylon, in addition to the dual functionality external fuel tank carrier pylon that also supports fuel transfer of the single functionality pylon.

As to claim 10, it now depends on claim 8 and can be any military aircraft vehicle, such that the claim is clarified.

As to claim 11, it now depends on claim 1, such that the civilian aircraft is a limitation that provides an example of the aerial vehicle.

As to claim 12, it now depends on claim 1, such that the multi-role rotary-wing aircraft is a limitation that provides an example of the aerial vehicle.

As to claims 13 and 15, they have been cancelled with prejudice to conform with the original drawings.

Antecedent basis in claims 2-4 and 24 have been corrected.

CLAIM REJECTIONS – 35 USC 103

The Examiner rejected claims 1-29 under 35 U.S.C. 103(a) as being anticipated by Arnold, US patent number 4,790,350 (hereafter Arnold), in view of Grafwallner, US patent number 5,660,358 (hereafter Grafwallner) and Walker, US patent number 4,589,615 (hereafter Walker). Applicant hereby traverses the Examiner's statement.

The examined application provides for an apparatus and method that enable addition of fuel stores to an aerial vehicle and connection of the added fuel stores to the fuel system of the aerial vehicle. Such fuel stores are carried by pylons that are not connected to the fuel system of the aerial vehicle, for example pylons used for carrying weapons. The connection is enabled by the dual functionality external fuel tank carrier pylon. The external fuel stores of claim 1 are the fuel tanks added to the aerial vehicle. The addition may be performed by connecting the external fuel stores to the Stores Transfer Kit (STK) connected to fuel system of the aerial vehicle, for example connecting to the wing of the aerial vehicle. The fuel from the added fuel stores is transmitted to the fuel system of the aerial vehicle via the external fuel lines (see the last prong of claim 1). The term "external" means that the fuel line is not part of the original fuel system of the aerial vehicle that comprises built-in fuel tanks and fuel lines. The system of claim 1 is mainly adapted to provide fuel from the added fuel stores to the fuel system of the aerial vehicle.

The system disclosed in claim 1 is significantly distinguished from the prior art cited in the Office Action. Arnold provides for a pylon P and a fuel tank connected

thereto. The pylon P is connected to the wing that contains fuel pipes that provide fuel to the engine of the aerial vehicle. As a result, the fuel tank of Arnold is connected directly to the fuel system of the aerial vehicle. Such connection is known and is part of conventional fuel systems in aircraft vehicles. The examined application discloses fuel stores that are not part of the fuel system and connecting the added fuel stores to the fuel system.

Grafwallner provides for fuel transfer between fuel tanks. Grafwallner does not disclose a system that allows addition of fuel stores on the aircraft vehicle and connecting the added fuel stores to the fuel system of the aircraft vehicle, neither is the combination of Arnold and Grafwallner. The addition of Walker does not provide for such connection. The fact that there are two pylons in an aircraft is not new, and is not claimed in the examined application.

The connection between the added fuel store mounted on a pylon to an existing fuel system cannot be implemented by Walker that provides for two missiles mounted on pylons. Even if a person skilled in the art would convert missiles to fuel tanks, the connection between the added fuel tanks is not disclosed in Walker, which only provides for a Pylon and a fuel tank or missile, not connection of the fuel tank to the fuel system. Further, none of the cited references provides for connection of additional fuel stores, which are not part of the original fuel stores but added to pylons of the aerial vehicle, to the fuel system of the aerial vehicle, such that they provide fuel directly to the fuel system.

None of the references cited by the examiner disclose limitations such as "external fuel line is located externally to the aerial vehicle and connected to an existing fuel system of the at least one aerial vehicle", "external fuel tank, carried by a pylon not connected to the fuel system of the aerial vehicle, is enabled to provide fuel directly to the fuel system of the aerial vehicle", "the newly added fuel tanks provide fuel to directly the fuel system of the at least one aerial vehicle", and "transferring fuel between newly added fuel tanks carried by pylons that are not connected to the fuel system of the aerial vehicle to dual functionality fuel tanks pylon mounted on an existing external fuel tank".

The independent claims are non-obvious since they depend on claims 1 and 30 that contain limitations that are not disclosed in either of the references cited by the examiner,

for example the movement guidance bars that provide rigid track using which the ordnance units can be transferred.

Examiner is hereby requested to allow the claims.

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1. (Currently amended) A system for increasing fuel storage volume and fuel carriage capacity of external fuel stores suspended on an aerial vehicle by formation of at least one external extended fuel stores configuration, the system comprising:

at least one dual functionality external fuel tank carrier pylon providing fuel tank carriage capability and fuel transfer and control capabilities from at least one externally carried fuel tank and to support fuel transfer and control capabilities for at least one associated single functionality external fuel tank carrier pylon carrying at least one external fuel tank;

at least one single functionality external fuel tank carrier pylon providing fuel tank carriage capability and fuel transfer and control capabilities from at least one externally carried fuel tank;

at least one externally mounted Stores Transfer Kit to provide enclosure for at least one external fuel line and at least one external fuel control line linking between the at least one single functionality external tank carrier pylon and the at least one dual functionality external tank carrier pylon, said external fuel line is located externally to the aerial vehicle and connected to an existing fuel system of the at least one aerial vehicle;

whereby an alternative external fuel transfer and fuel control path is established between at least one external fuel tank carried by the at least one single functionality external fuel tank carrier pylon and the fuel system of the aerial vehicle via the at least one externally mounted Stores Transfer Kit, and the at least one dual functionality external fuel tank carrier pylon, such that the external fuel tank, carried by a pylon not connected to the fuel system of the aerial vehicle, is enabled to provide fuel directly to the fuel system of the aerial vehicle.

2. (Currently amended) The system according to claim 1 wherein the at least one dual functionality external fuel tank carrier pylon further comprises:

at least one fuel connector to link a fuel transfer system of the at least one dual functionality external fuel tank carrier pylon to at least one fuel connector of the aerial vehicle fuel system;

at least one compressed air connector to link a compressed air system of the at least one dual functionality external fuel tank carrier pylon to at least one compressed air connector of the aerial vehicle fuel control system;

at least one electric power and signal connector to link an electrical system of the at least one dual functionality external fuel tank carrier pylon to at least one electrical and signal connector of the aerial vehicle fuel control system;

at least one fuel connector to link the fuel transfer system of the at least one dual functionality external fuel tank carrier pylon to at least one fuel extension line installed in the at least one externally mounted Stores Transfer Kit;

at least one compressed air connector to link the compressed air system of the at least one dual functionality external fuel tank carrier pylon to at least one compressed air extension line installed in the at least one external externally mounted Stores Transfer Kit;

at least one electric power and signal connector to link the electrical system of the at least one dual functionality external fuel tank carrier pylon to at least one electrical and signal line installed in the at least one external externally mounted Stores Transfer Kit;

3. (Currently amended) The system according to claim 1 wherein the at least one single functionality external fuel tank carrier pylon further comprises the elements of:

at least electrical connector to link an electrical control system of the at least one single functionality external tank carrier pylon to a fuel system of the aerial vehicle;

at least one fuel connector to link the fuel transfer system of the at least one single functionality external fuel tank carrier pylon to at least one fuel extension line installed in the at least one externally mounted Stores Transfer Kit;

at least one compressed air connector to link a compressed air system of the at least one single functionality external fuel tank carrier pylon to at least one compressed air extension line installed in the at least one externally mounted Stores Transfer Kit;

at least one electric power and signal connector to link the electrical control system of the at least one single functionality external fuel tank carrier pylon to at least one electrical and signal line installed in the at least one externally-mounted Stores Transfer Kit.

4. (Currently amended) The system according to claim 1 wherein the at least one externally mounted Stores Transfer Kit comprises the elements of:

at least one aerodynamically shaped external envelope to protect the enclosed internal elements and to provide aerodynamic efficiency to the aerial vehicle to which the extended external fuel stores configuration is applied;

at least one extension fuel line linking a fuel transfer system of the at least one single functionality external fuel tank carrier pylon to a fuel transfer system of the at least one dual functionality external fuel tank carrier pylon;

at least one extension compressed air line linking the compressed air system of the at least one single functionality external fuel tank carrier pylon to a compressed air system of the at least one dual functionality external fuel tank carrier pylon;

at least one extension electric power and signal link an electrical system of the at least one single functionality external fuel tank carrier pylon to the electrical system of the at least one dual functionality external fuel tank carrier pylon.

5. (Original) The system according to claim 1 further comprises the elements of:

at least one fuel quantity monitoring device to display the quantity of fuel store in the at least one external fuel tank carried by the at least one single functionality external fuel tank carrier pylon; at least one display device to indicate the status of the at least one external fuel tank and the status of the at least one single functionality external fuel tank carrier pylon;

at least one control device to control the fuel transfer sequence from the operative fuel containers constituting the external extended fuel stores configuration.

6. (Original) The system according to claim 2 wherein the dual functionality external fuel tank carrier pylon further comprises a specific indicator to control the transfer sequence of the fuel stored in the at least one fuel tank suspended on the at least one single functionality external fuel carrier pylon and in the at least one external tank suspended on the at least one dual functionality external fuel tank carrier pylon.
7. (Cancelled)
8. (Original) The system according to claim 1 wherein the aerial vehicle is a multi-role military aircraft.
9. (Original) The system according to claim 8 wherein the aerial vehicle is a F-16 Fighting Falcon multi-role fighter aircraft.
10. (Currently amended) The system according to claim 8 wherein the aerial vehicle is an Uninhabited Aerial Vehicle (UAV).
11. (Currently amended) The system according to claim 1 wherein the aerial vehicle is a civilian aircraft.
12. (Currently amended) The system according to claim 1 wherein the aerial vehicle is a multi-role rotary-wing aircraft.
13. (Cancelled)
14. (Cancelled)

15. (Cancelled)

16. (Original) The system according to claim 1 wherein the dual functionality external fuel tank carrier pylon is a standard external fuel tank carrier pylon converted to dual functionality role.

17. (Original) The system according to claim 16 wherein the at least one dual functionality external fuel tank carrier pylon is a novel, specifically designed and developed device.

18. (Original) The system according to claim 1 wherein the at least one single functionality external fuel tank carrier is a novel, specifically designed and developed device.

19. (Original) The system according to claim 1 wherein the elements of the extended fuel stores configuration are transparent to the aerial vehicle.

20. (Original) The system according to claim 1 wherein the elements of the extended fuel stores configuration are detachably installed on an aerial vehicle.

21. (Original) The system according to claim 1 wherein the elements of the external extended fuel stores configuration include secondary control and emergency release means.

22. (Original) The system according to claim 1 wherein the at least one dual functionality external fuel tank carrier pylon is suspended on an inboard “wet” stores station having fuel transfer, control, refueling, monitoring, and jettisoning capabilities.

- 23.(Original) The system according to claim 1 wherein the at least one single functionality external fuel tank carrier pylon is suspended on at least one outboard wing “pseudo-wet” stores station having jettisoning capabilities.
- 24.(Currently amended) The system according to claim 23 wherein comprising a at least one outboard stores station is provided with a dual “pseudo-wet/dry” functionality allowing and supporting the carriage of at least one single functionality external fuel tanker pylon and other pre-defined stores.
- 25.(Original) The system according to claim 4 wherein the externally mounted Stores Transfer Kit is substantially re-configurable according to the types and variants of the aerial vehicles to provide for optimal aerodynamic characteristics and acceptable flight envelope.
26. (Original) The system according to claim 4 wherein the externally mounted Stores Transfer Kit is operative in the transfer of fuel stores between at least two stores carriers.
27. (Original) The system according to claim 4 wherein the externally mounted Stores Transfer Kit is operative in the transfer of stores between an external store and an internal store.
- 28.(Original) The system according to claim 1 wherein the externally mounted Stores Transfer Kit is operative in the transfer of electronic countermeasures between at least two stores carriers.
- 29.(Original) The system according to claim 4 wherein the externally mounted Stores Transfer Kit is operative in the transfer of projectiles between at least two stores carriers.

30. (Currently amended) A method for increasing the fuel storage volume and the fuel carriage capacity of external fuel stores suspended on an aerial vehicle by the formation of an external extended fuel stores configuration, the method comprising:

converting at least one standard external fuel tank carrier pylon in order to provide support for the transfer, monitoring and control of a fuel store held in at least one fuel contained suspended on an adjacent external fuel tank carrier pylon;

obtaining at least one dual functionality external fuel tank carrier pylon in order to provide the transfer of fuel stored in a carried external fuel tank to the aircraft fuel system via the at least one converted external fuel tank carrier pylon;

transferring fuel between newly added fuel tanks carried by pylons that are not connected to the fuel system of the aerial vehicle to dual functionality fuel tanks pylon mounted on an existing external fuel tank, using a fuel line external to the fuel system of the aircraft vehicle;

the newly added fuel tanks provide fuel to directly the fuel system of the at least one aerial vehicle;

thereby forming an alternative external fuel transfer path between an at least one external fuel tank suspended on the at least one dual functionality external fuel tank carrier pylon via the at least one external Stores Transfer Kit, via at least one converted external fuel tank carrier pylon, to the fuel system of an aerial vehicle.

31. (Previously amended) The method according to claim 30 further comprising the steps of:

designing the elements constituting the at least one external extended fuel stores configuration;

ground testing the elements constituting the at least one external extended fuel stores configuration;

flight testing the elements constituting the at least one external extended fuel stores configuration;

altering the combination of the elements of the at least one external fuel stores configuration in accordance with the types and variants of an aerial vehicle

certifying the at least one extended external fuel stores configuration.

32. (Original) The method according to claim 30 further comprises modifying in an ergonomic manner the Stores Control Console of the aerial vehicle by the addition of fuel gauges, fuel status displays, and fuel transfer selectors.

33. (Original) The method according to claim 30 further comprises modifying the control routines of the Stores Control Computer installed in the aerial vehicle to effect automatic and semi-automatic sequencing of the fuel transfer from the fuel containers of the extended external fuel stores configuration.

34. (Original) The method according to claim 30 further comprises uploading the elements constituting the at least one external extended fuel stores configuration on an aerial vehicle in order to enable the performance of a mission requiring substantially large quantities of fuel.

35. (Original) The method according to claim 30 further comprises preserving the original functionality of the functionally modified “pseudo-wet” stores stations.

36. (Original) The system according to claim 1 wherein the externally mounted Stores Transfer Kit includes extension fuel lines and extension compressed air lines with a variety of gauge sizes.